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COMMONWEALTH PHYTOPATHOLOGICAL NEWS

A QUARTERLY REVIEW OF NEWS AND VIEWS ISSUED BY THE COMMONWEALTH MYCOLOGICAL INSTITUTE, KEW, SURREY

MAIN ITEMS

Plant quarantine

Pest Control Products Nomenclature

Pepper Disease in Sarawak

New C. M. I. Building

Notes from Overseas

PLANT QUARANTINE TECHNIQUE

In recent years there has been considerable activity in the field of plant disease legislation, especially in its international aspects. This activity is welcomed for it is essential to progress. The actual technique of plant quarantine, however, is a matter of great importance to the plant pathologist for mere paper agreements will never be effective without the requisite services to make them function. The establishment of plant quarantine stations with adequate personnel will not be the least important of the matters now requiring consideration. In many parts of the world quarantine stations simply do not exist and some under-developed countries are even without the services of a single plant pathologist. It is most encouraging that a start has been made in devising the necessary international legislation but very much still requires to be done.

The development of an efficient plant quarantine technique is not easy. In tropical countries glasshouses are apt to become overheated and however much one would like to use them this has not been possible on any scale up till now. Dr. C. G. Hansford now spending some time at the Institute, has plans for solving the problem so far as the Waite Institute is concerned by spraying the outside of his new quarantine house with well-water which is afterwards to be used for irrigation purposes. In Trinidad a special greenhouse has been erected with cooling apparatus, which, however, appears to be less effective than was hoped. Dr. Storey has recently established a quarantine station at Muguga in Kenya and in the next issue it is hoped he will give us an account of it. In future issues we may have descriptions of other stations, even outside the Commonwealth, for the subject is a live one and information is not readily accessible. Contributions on the subject will be welcomed.

In plant disease control, very often exclusion is the only method open to the plant pathologist and more and more attention must be given to the procedure in order to make exclusion as effective as possible. Every plant pathologist with

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experience in tropical countries knows the serious damage that is caused from time to time by newly introduced plant diseases. These introductions occur in spite of all the care that is taken to prevent their occurrence and whilst it may not be feasible to prevent them altogether it does appear that techniques should be continually under review with the object of improving them. The recent developments in plant disease eradication afford some grounds for hoping that similar methods may be successful in dealing with new introductions and this in itself should stimulate greater interest in measures of exclusion and eradication.

One of the ever-present dangers of quarantine is the difficulty of detecting virus carriers. Recently in Oregon evidence was obtained that material which had passed through quarantine in California carried the virus of cherry Pfeffingerkrankheit previously only reported from Europe. This demonstrates how desirable it is to test all quarantine material for the presence of viruses either by grafting on susceptible hosts, or by some other method.

Sometimes introductions of dangerous material may be prevented by appropriate action by plant pathologists themselves. Years ago Professor E.S. Salmon got to know that a parcel of hop cuttings from a locality in Kent where hop downy mildew was prevalent had been sent to an address in Australia. He immediately communicated with Sir Edwin Butler, then Director of this Institute, who warned the Australian authorities with the result that the parcel was traced to a certain ship and on the ship's arrival the Australian authorities recovered the parcel and destroyed it. It can safely be said that but for the destruction of this parcel hop downy mildew might well have been introduced into Australia. Co-operation between the exporting country and the importing country is requisite and nothing could be more helpful to the establishment of confidence than action such as that described.

In quarantine problems it is frequently found that lack of available knowledge is the cause of much difficulty. To provide for the unknown is not a popular proceeding, for no-one likes to take precautions which may really be superfluous but for the present at any rate it is best not to run risks when the issues are as tremendous as they often appear to be.

Seed-borne diseases constitute a special problem to the quarantine officer for it is not usually practicable to raise seed in quarantine and treatment with seed disinfectant does not always guarantee complete freedom from disease, especially from pathogens borne internally. At the recent Commonwealth Mycological Conference Professor Muskett remarked on the desirability of the choice of areas free from specific parasites where seed free from the disease or diseases in question could be raised. There are parts of the world where certain diseases cannot exist and even if diseased seed is sown the resultant plants are healthy. Seed produced in such areas can be relied upon to be free from the disease in question and it would seem entirely possible to organize the production of disease free seeds which would be capable of being passed through quarantine very expeditiously, especially if certified by a responsible plant pathologist that the growing crop was free from other diseases as well. Such disease-free seed would be welcomed by overseas plant pathologists and most probably would find a ready and profitable market.

These are a few of the points that arise in plant quarantine technique. There are many others but enough has been said to introduce a thorny subject and to indicate that it is one that needs discussion.

S.P.W.

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the moment all countries are being asked to submit details of the practice that they follow in adopting common names for pest control products, and, when these have been received, it is hoped that it will be possible to convene a first meeting. Clearly the valuable work that has already been done will be enhanced if international agreement on common names is attained.

The B.S.I. committee continues to examine the position with regard to new products, and the publication of the revision of B.S.1831 will in no sense mark and end, or even an interval, to the work.

NOMENCLATURE FOR PEST CONTROL PRODUCTS

Work of the British Standards Institution

In recent years very great developments have occurred in the production of chemicals for pest control*. Most of these are of a complex organic nature, and consequently their chemical names are too complicated for common use. This had, until recently, resulted in the haphazard adoption of shortened forms or trade names, very often consisting of initial letters or numbers. The position was further aggravated by the fact that several terms might apply to the same compound.

After discussion on this problem had taken place at the Commonwealth Entomological Conference in 1948 it was decided to set up a Technical Committee of the British Standards Institution to prepare lists of recommended common names for pest control products. It first sat in October 1949, and to date (March 1955) has held thirty-five meetings.

This committee is widely representative of manufacturers, users, and Government bodies, and has ample Commonwealth connections. Furthermore there has been the closest collaboration with the Interdepartmental Committee on Pest Control in the United States. Wherever possible the names adopted have been the same as those used for a similar purpose in that country.

In order to avoid conflict with proprietary names H. M. Patent Office are asked to recognise the availability of names for common usage, but they do not register them as Trade Marks. Often manufacturers have been prepared to abandon their rights to their own Trade Marks provided that the B. S. I. Committee adopts them for the list.

Certain guiding principles have been followed in considering the suitability of names for common usage. The committee will not give a common name to a compound until assured that it is likely to be either manufactured or used in the United Kingdom in reasonable quantities. Further if the chemical name itself is reasonably short and distinctive (e. g. metaldehyde), the adoption of a simple common name is not thought necessary. If a common name has already officially been adopted in other countries preferential consideration is given to it.

The names should preferably be short, distinctive in sound and spelling and, if possible, they should be derived from a combination of syllables from the scientific chemical name. They should not be liable to confusion with common or trade names already in use, or difficult to pronounce or remember.

Wherever possible the name should neither be composed of initials nor include numbers. In the early days of the committee's work, however, exceptions were made to this in the case of certain designations which were considered to be too well established to alter e. g. DDT, BHC, 2, 4-D. These same exceptions also affected the principle that the common name should be written or printed with a small initial letter. The name, apart from a few specified exceptions, applies to the 100 per cent. pure chemical or active ingredient.

The first list of names was published by the Institution as B. S. 1831: Part 1 in April 1952. It contained thirteen insecticides, five fungicides, and nine herbicides. Part 2 followed in November 1953 with a further four insecticides, one fungicide, and one rodenticide. Both these documents can be purchased from the Institution, 2, Park Street, London, W. 1.

Since 1953 the committee has been working on a projected Part 3 to B. S. 1831. It was recently decided, however, that both as a matter of convenience and also since the Chemical Society had recently adopted a revised system of nomenclature it would be desirable to publish the entire list under one cover. Tentatively it is hoped that this may be published by the end of 1955, and it will probably list about fifty pest control products of all types, including about ten fungicides.

As in the case of the previous lists it will contain details of the chemical name, giving prominence to the official name recommended by the Chemical Society, and of the chemical formula. Cross reference will be made to alternative names (but not to trade names).

In the international field all members of the International Organization for Standardization (ISO) have been invited to participate in the work of an ISO Technical Committee, of which the United Kingdom holds the Secretariat. At

(Continued on p. 18)

* Including insecticides, fungicides, herbicides, and rodenticides

PEPPER DISEASE IN SARAWAK

N. F. Robertson, Botany School, Cambridge

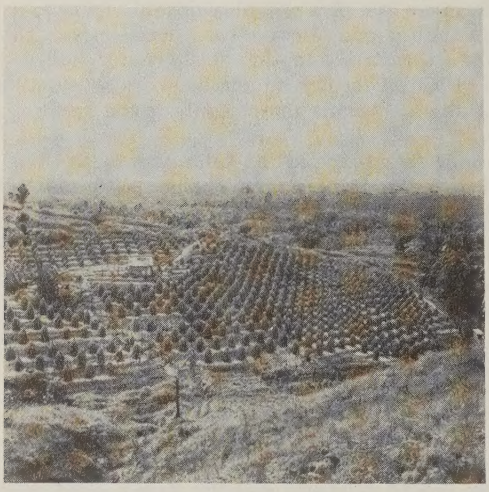


Fig. 1. Pepper garden near Miri showing habit of the growing plant.

Owing to a series of political circumstances Sarawak, which before the war was an important source of pepper (Piper nigrum), has for some years past been the main supplier of the world market. The price of pepper has been high (about £80 per picul of 133 lbs. in 1951 for white pepper and about half that for black pepper); in late years the difference in price between black and white pepper has not been maintained but the price yield per acre is still high, being several hundred pounds sterling, varying with circumstances. There has accordingly been an increase in pepper-growing in suitable areas (Fig. 1) but the Government in an effort to conserve the natural resources has limited the taking over of new land for pepper cultivation.

In May, 1953, the writer was asked by the Colonial Office to investigate reports of a serious root disease in the main pepper growing area of Sarawak. Some 3 months were spent in Sarawak where survey and cultural work was carried out to the best of the facilities available. Since then some of the aspects of the disease have been studied at Cambridge. It is clear that there is a serious root disease of pepper in Sarawak, the etiology of which remains a mystery.

The Symptoms of the Disease

On the best soils and where the vines are growing most strongly the disease is remarkable for the sudden and dramatic onset of the above-ground symptoms. A normal healthy vine is columnar in shape and its dark green foliage, borne on the peripheral branchlets, forms a screen through which it is impossible to see. The first sign of the disease is a faint yellowing of the leaves (Fig. 2). The older leaves are affected first and in individual leaves the yellowing commences as a transitory vein banding. Associated with this stage is a limited leaf drop, the plant looks less upstanding and it becomes possible to see through the foliage, though only just so.

The next stage, which follows rapidly is the development of a general wilt of the whole vine and an intensification of leaf drop which results in the accummulation on the ground of a large number of yellow-green leaves (Fig. 3). Alternatively all the leaves on the plant may turn brown and wither and then drop. Whether or not the leaves are shed at the yellow-green stage, the last to drop are the terminal three leaflets of the fruiting branches. These eventually wither and can be found on the tree some time after death has taken place.

Symptoms can also be observed in the fruit which may be affected by shrivelling at any time during the wilting process. In the later stages of wilting the smaller branches disarticulate at the nodes so that the final result is a dead vine consisting of the three upright branches and the main branches at right angles to these, but without any of the finer branchlets.

Root Symptoms

The above-ground symptoms which appear so suddenly (within a week in some

cases) are the direct result of the progressive dying of the root system which has been taking place for a considerable time. At the time when the first above-ground symptoms are visible the whole root-system and the base of the above-ground stem are rotten and blackened. The advancing edge of the blackened and rotten region is sharply demarcated in the cortex and bark. Within the healthy cortex, in advance of the rot, there can be found blackened vascular tissue which can be followed for a considerable distance in the root or stem. When wilting has taken place the blackened vascular tissue can be followed up the apparently healthy stem

Fig. 2. (above) Yellowing of leaves is the earliest above-ground symptom.

Fig. 3. (right) Early wilt symptoms.

for some 14 or 15 nodes i. e. for one or all of the 3 main stems. It can also be seen occasionally in lateral branches arising from the main stems, but not to any marked degree — allowing for the fact that all pepper tissue blackens when it is finally dead.

If the root systems of pepper in contact with diseased vines are examined the stages in the progressive die-back of the root system which finally gives rise to the death of the plant can be observed. The plants immediately adjacent to the frankly diseased plant show, on the whole, most destruction of the root system and vice versa. The most difficult stage to describe with certainty is the initial infection of the fine roots for, in the absence of cultural studies, it is difficult to be sure what is a true lesion and what is not. By tracing back the root symptoms one is led to conclude that the first recognisable symptom is a black streak on the outside of the cortex of the newest roots. The very finest roots show a variable amount of complete die-back, some of which is not due to old age alone, but the presence of eelworms (see below) and fungi such as Fusarium spp. and Botryodiplodia make a good assessment difficult.

Slightly thicker roots (1 mm. and upwards) show definite black lesions which spread along one side of the root, from 3 mm. to several centimetres in length and about half the diameter of the root. Very occasionally such a lesion would be associated with the die-back of a fine rootlet emerging from the centre of a lesion, but on the whole the lesions appear not to be associated with fine rootlets. In some of these black surface lesions transverse cracks can be seen but it is also possible to find transverse cracks in the cortex of apparently healthy roots. It is possible that these cracks are formed during the removal of the root from the soil but it is also possible that they have some significance in the etiology of the disease.

Sections cut through the longitudinal black lesions on the roots show various degrees of collapse and disintegration of the cortex, and in a number of cases this necrosis spreads inwards to the endodermis and gives rise to a blackening

of the stele, which in some can be found to have spread a considerable distance from the apparent site of the lesion. Older root lesions, which appear to have developed from this simple beginning, show a considerable involvement of the cortex and extensive blackening of the stele. This in turn gives place to slightly older roots which show a complete rotting of the cortex and stele so that the distal part of the root is free and consists of a markedly rotten cortex enclosing a darkened stelar portion. Rotting progresses towards the crown of the plant and as the cortex and interfascicular parenchyma decay the vascular bundles of the root, no longer covered by cortex, fray out like the bristles of a primitive paint brush.

The roots of a pepper vine arise from the 6 or 7 buried nodes of the cutting base and spread from the node about 4-5 feet in a horizontal direction and 2-3 feet vertically; their exact position and disposition vary with the local soil conditions. Some roots tend to spread laterally and some to go straight down. The rotting of the roots continues slowly from the periphery inwards or from below upwards. Sometimes as it spreads the rot will encounter a branch root which it may attack in the opposite direction from base to tip. The rot progresses relatively slowly; it is apparently a matter of months before the whole root system is rotted. One root only may be rotted in its entirety and bring about the rotting of the large stem base which originates from the buried part of the cutting. This rots from the point of infection towards the base and towards the apex, and any unaffected roots rot from their proximal to their distal portions.

Throughout this rotting of the roots and stems the discolouration of the vascular system precedes the rotting of the cortex. The length of discoloured vascular tissue in advance of the rotted cortex varies greatly, being from several inches to one foot in length, except at the time of death of the vine, when the discolouration may extend as high as 15 nodes from ground level i. e. about 3 feet. During the period of rotting the vine appears completely healthy on above-ground inspection but as soon as the rotting of the cortex on the stem base has involved the last healthy root the vine suddenly collapses (Fig. 4).

Possible causes of the disease

Isolations have been made from diseased roots and stems on a variety of media. Many different fungi were isolated but none consistently. Species of Fusarium were occasionally isolated in runs and a mixture of isolates was used to inoculate seedling peppers without effect. On a later cultural study it became clear that we were dealing with a number of forms from the sections Martiella and Elegans. However no one cultural form was isolated with any regularity from pepper. Similarly large numbers of bacteria were isolated from various parts of the root system of diseased plants but further morphological study and inoculations in the field and at Cambridge failed to show any cultural constancy of pathogenicity among these isolates. These isolations were made in July and August and it is possible that the early onset of symptoms is seasonal and that isolations made earlier might be more successful.

Two other parasitic affections may be related to the disease. The first is Meloidogyne spp. the tropical root-knot eelworm which is everywhere on pepper roots in Sarawak. Whether it builds up in individual gardens to cause the onset of the root-rot disease can only be solved by detailed field studies. The second is a possible virus disease which manifests itself as a severe and a mild mosaic of the leaves. The mild mosaic symptom is extremely common but shows no particular relationship to the root rot symptoms.

If no parasite can be found responsible for the disease there remain a number of environmental factors which must be pursued. The pepper vines are growing on heavy soils under a high rainfall. Their natural habitat is in forest soils with tree supports. In contrast they are cultivated on bare hill sides, on small mounds of clay. Combined with this they are extremely heavily manured and give large yields. There are therefore many possibilities for physiological conditions arising which could lead to disease.

The extent of the disease

The disease was found in all parts of Sarawak visited. It was worst on the better soils and among the highest yielding vines. Observations showed that once

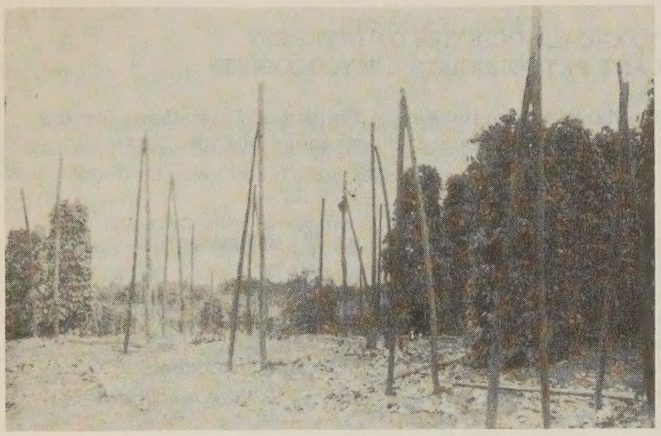


Fig. 4. An affected garden. Note the apparent good health of the remaining trees.

a garden was infested all the vines eventually died. It was extremely difficult to estimate the total amount of disease but a conservative estimate would be that 15% of all gardens in the Kuching – Serian district (the main pepper growing area) are infested and that most of these gardens have at least a quarter of the vines affected. There is evidence from the written records that pepper growing in the past was often terminated by the onset of a condition similar to that described above and it became traditional that pepper growing required a continued access to new land. It is clear that very similar pathological conditions of pepper have been and are serious in all the pepper growing areas of the East and that there has been no clear cut demonstration of the etiologic agent in any of the areas. It is clear that the problem is one of great difficulty which will have to be tackled in a whole-hearted way.

The Name of the Disease

There is considerable variation in the name given to the disease described here and indeed it is difficult to discover from the literature that all the conditions described are similar. The earlier references are to Pepper Disease, Pepper Wilt, Root Disease of Pepper, Pepper Root-Rot Disease, and in cases where particular organisms are involved such names as "Phytophthora Root-Rot". In correspondence recently the name Sudden Death disease has been used. It is convenient to have a simple and generally accepted common name for a disease of unknown etiology and the author suggests that the earlier writers were most correct in pointing to root-rotting as the important aspect of the disease. As, however, a number of known parasites can cause root-rots of pepper it is thought that a descriptive adjective should be added for the conditions described here. The name proposed for the disease is the Frayed Root-Rot of Pepper. This draws attention to the symptom as shown in Fig. 5.

Fig. 5. Characteristic fraying of diseased root.

Since this article was written the attention of the author has been drawn to Van der Vecht's suggestion that the pepper disease in Sarawak is identical with the yellow disease of pepper in Bangka Island attributed to the eelworm Radopholus similis. Mr. Robertson considers this suggestion of the greatest interest and one which should be followed up.

BIOLOGICAL SOCIETIES OF INTEREST TO PLANT PATHOLOGISTS & MYCOLOGISTS

The following are the dates of meetings until the end of July; those for the remainder of the year will be published in the next issue of C.P. News.

APRIL

1	Association of Applied Biologists (A.G.M. in London)
6	Royal Entomological Society
6	Royal Microscopical Society (Biological Section)
12-15	International Union of Biological Sciences (12th Gen. Assembly, Rome)
18	Society for General Microbiology (London)
19-20	" " " " (Symposium in London)
21	Linnean Society

MAY

4	Royal Entomological Society
4	Royal Microscopical Society (Biological Section)
5	Linnean Society
11-15	British Mycological Society (Pendley Manor)
20	Association of Applied Biologists (Alice Holt)
24	Linnean Society

JUNE

1	Royal Entomological Society
24-25	British Mycological Society (Field Meeting: East Malling)

JULY

4-6	Society for Applied Bacteriology (Cambridge)
6	Royal Entomological Society

SOME ADDRESSES OF SECRETARIES —

Association of Applied Biologists: Dr. R.K.S. Wood, Dept. of Botany, Imperial College, London, S.W. 7.
British Mycological Society: J. Webster, Dept. of Botany, The University, Sheffield, 10.
Linnean Society (Botanical): Dr. George Taylor, The Linnean Society, Burlington House, London, W. 1.
Royal Entomological Society of London: E.B. Britton, R.E.S., 41 Queen's Gate, London, S.W. 7.
Royal Horticultural Society: Brigadier C.V.L. Lycett, R.H.S., Vincent Square, London, S.W. 1.
Royal Microscopical Society: Dr. F.J. Anmonia, F.J. Cuckow, R.M.S., Tavistock House South, Tavistock Sq., London, W.C. 1.
Society for Applied Bacteriology: G. Sykes, Boots Pure Drug Co. Ltd., Microbiology Division, Standards Dept., Nottingham.
Society for General Microbiology: Prof. K.E. Cooper, Depts. of Preventive Medicine, The University, Bristol.
Systematics Association: R.D. Meikle, Royal Botanic Gardens, Kew, Surrey.
Institute of Biology: D.J.B. Copp, Inst. Biol., Tavistock House South, Tavistock Sq., London, W.C. 1.

The 14th International Horticultural Congress will be held at Scheveringen, Holland, from Aug. 29 to Sept. 6. Enquiries from Hon. Sec., Int. Hort. Congr., Ministry of Agriculture, Bezuidenhout 30, The Hague.

PERSONAL NEWS

Visitors at C. M. I.

G. O. Gadd of the Centrallaboratorium, Helsingfors, Finland came to discuss problems connected with wood pulp and Q. A. Ahmad called from the Botanical Department, Dacca University, Pakistan.

S. J. Hughes of the Division of Plant Pathology, Science Service, Ottawa, spent several days on his way to Berlin to work on Hyphomycetes in the Herbarium of the Botanical Garden & Museum. He will then continue his research at Prague, Padova, Uppsala and will examine material in Fuckel's Herbarium at Geneva.

Appointments, Transfers & Retirements

The following appointment has been made in the Colonial Research Service:

T. Williams, Plant Pathologist, North Borneo.

F. C. Deighton, O. B. E., M. A., who recently retired from Sierra Leone after a period of service with the Colonial Office dating from July, 1926, has been appointed Mycologist at the C. M. I. and takes up his duties in May.

A. S. Boughey, Professor of Botany, University College of the Gold Coast, has accepted the Professorship of Botany, University College of Rhodesia and Nyasaland, Salisbury, S. Rhodesia.

G. Orian is on leave pending retirement from the post of Plant Pathologist, Mauritius; L. Orieux is acting.

Royal Society

E. J. H. Corner, Botany School, Cambridge, has been elected F. R. S.

Indian Phytopathological Society

The following have been elected as Officers and Council for 1955:

President: K. D. Bagchee

Vice-President: M. J. Thirumalachar

Secretary-Treasurer: R. Prasada

Council: M. R. S. Iyengar (N. Zone), S. Chowdhury (E. Zone), M. K. Patel (W. Zone), S. Sinha (Mid-E. Zone), S. Vaheeduddin (Cent. Zone), T. S. Sadasivan (S. Zone).

Nairobi Scientific and Philosophical Society

H. H. Storey has been elected a Vice-President and R. W. Rayner a member of committee for 1955.

British Commonwealth Culture Collections

It has been agreed that the South African Bureau of Standards should take over the development and maintenance of the National Collection of Micro-organisms in the Union.

Mr. W. R. Mottram and his alternate Mr. G. Smith have been nominated to serve as S. African representatives on the Permanent Committee. Their address is:-

c/o South African Bureau of Standards,
P. B. 191, Pretoria, South Africa.

THE NEW C. M. I. BUILDING

(Continued)

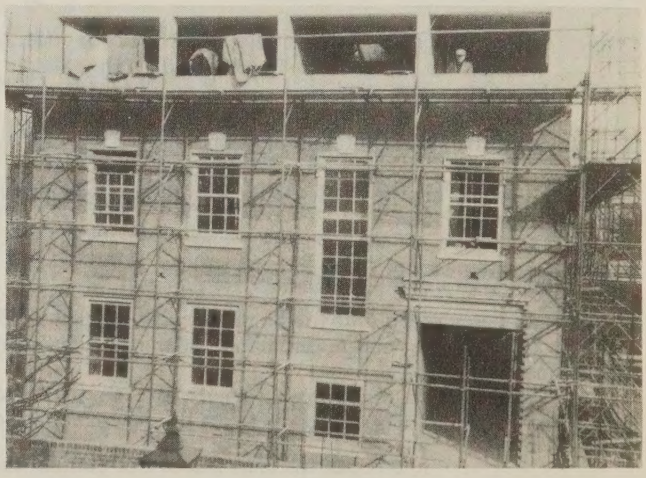
North elevation from towpath.

Further rapid progress has been made despite the blizzards with which we have been afflicted this year. Kew registered 2°F. on one occassion in February.

Most of the brickwork has now been completed and as I write I can see the ornamental coping stone being affixed on the roof. The interior is well advanced and it is now possible to see the shape of things to come.

The basement will house the new micro-film unit, which when in operation will greatly assist in the production of micro-cards of fungus diagnoses and the many other publications of the Institute which are now being photolithed. There is also a large general store and boiler room.

On the ground floor is the Director's new office and the Library, the latter covering approximately 50ft × 40ft, giving much needed space for the present literature, and allowing for expansion. It will now be possible to put into practice



West wall from preparation room of present building

Top Floor: Culture Collection and visitors' laboratories in course of construction.

the library development scheme which has been in abeyance so long because of lack of space.

The Herbarium, with culture, documentation, accessions and duplicate collection rooms will cover about 55 ft × 40 ft and will have space for nine working mycologists, including the Chief Mycologist, as well as technical staff.

The top floor will house the Culture Collection, with bench space for nine: laboratory accommodation for nine visitors is also provided. When fully occupied by the latter there will no doubt be a nice little problem created for the tea club!

It is expected that the building will be completed in June, ready for inspection by delegates attending the C. A. B. Review Conference.

(To be continued)

"POOL" NOTES

Alternaria longipes in Nyasaland

J. C. F. Hopkins, who was seconded to the Pool for the purpose of investigating the serious outbreaks of Alternaria longipes which have caused heavy losses in flue-cured tobacco in Nyasaland in the last few years, has now returned to the Institute after a six-weeks visit to the Protectorate, Northern Rhodesia, and Southern Rhodesia. He was accompanied by B. E. J. Wheeler, who was recently appointed to the Pool and is staying on to continue research in collaboration with officers of the Federal Departments of Agriculture and the Tobacco Research Board.

The Colonial Development Corporation are interested in a flue-cured tobacco project near Kasungu in the Central Province and it was on their estate and those of some half-a-dozen other growers in the district that Alternaria leaf spot was threatening to become the limiting factor in economical production. There appeared to be no future for the project if the disease could not be controlled.

Hopkins has now reported to the Colonial Office, recommended control measures for immediate application, and in consultation with the Federal Departments of Agriculture and the Tobacco Research Board, has outlined a tentative research programme. He now returns to his editorial duties and R. A. Altson returns to the "Pool" after carrying out Hopkins' duties during his absence.

Root Disease of Pepper in Sarawak

R. A. Altson will shortly be going to Sarawak to continue the investigations commenced by N. F. Robertson, of Cambridge, on the "frayed root" disease of peppers, a preliminary account of which by the latter appears on p. 20.

AUSTRALIAN NOTES

Epidermal Exudation of Streptomycin from Treated Tomatoes

It has been found that tomato plants treated with Streptomycin at a concentration of 5 to 50 p.p.m., supplied via the roots from a nutrient solution, react to Phytophthora infestans infections with local lesions. In this way the plants can be rendered resistant to the pathogen (1).

During these investigations it was noted that at higher concentrations there was a significant reduction of the number of local lesions. In extreme cases no "hit" was observed at all. This occurred mainly in younger leaves which had expanded after the plant was placed in the streptomycin solution. This suggested that either these leaves had become more resistant to penetration or that streptomycin had been transferred from the leaf tissue into the water film in which the zoospores had been applied to the surface of the leaves. If the latter assumption is correct the antibiotic must have been present in the water film in sufficient concentration to prevent infection.

In order to determine whether streptomycin is present in the water film a series of leaves was moistened and allowed to remain in a moist chamber for 24 hours and the film assayed for streptomycin content by the filter paper disc method using B. subtilis as test organism. The results of the tests were positive. As a rule the concentrations recovered increased with increasing concentration in the nutrient solution supplied, and the water film on young leaves contained more streptomycin than older ones.

The concentration in the water film was usually at trace level and did not exceed 2 units/ml. in any leaf.

The tests were carried out under conditions in which no guttation could take place and since there had been no streptomycin in contact with the leaf surfaces it must be concluded that streptomycin permeates through the epidermis into the water film if the concentration within the tissue exceeds a specific limit.

K. O. Muller
J. H. E. Mackay

Division of Plant Industry,
C.S.I.R.O., Canberra.

(1) Nature 174, 4436, 878-8, Nov. 6, 1954.

NOTE FROM TANGANYIKA

George and Maud Wallace, as a farewell to Tanganyika, have announced the discovery of Valsa eugeniae causing a sudden death disease of cashew (Anacardium occidentale) at Lindi in 1951, some 100 trees in a plantation having become infected and a number killed. The symptoms on this host are similar to those of sudden death of cloves and comprise rigid chlorosis and "firing" of the leaves within 10 days or two weeks and a yellow discolouration of the wood of infected roots. The fungus was isolated from the latter and has been identified at the C.M.I. by E.W. Mason.

The Wallaces suggest that the pathogen may be more widely distributed on various host plants than has heretofore been suspected, and hint that plant pathologists should put it in the category of "possible" when investigating tree diseases.

NOTES FROM PAKISTAN

In Pakistan a Mycology and Plant Pathology Division in the Central Department of Plant Protection is responsible for co-ordinating the campaigns against major plant diseases, maintaining a Central Mycological Herbarium and attending to the research problems of national importance. In addition to this every Province or State has its own Plant Pathology Division responsible for research work on local problems and campaigns against diseases of economic plants.

With a view to stepping up food production in the country seed treatment campaigns against seed-borne and soil-borne diseases of cereals were carried out in 1953-54 with organo-mercurial compounds (Agrosan GN and Granosan M). During this period 250,000 bushels of seeds were treated which gave on an average an overall increase of 850,000 bushels worth Rs. 75 millions. To popularise seed-treatment campaigns farmers are being supplied with the chemicals free of cost.

Wheat rust appeared in epiphytotic form in some parts of the Punjab in 1953-54 causing heavy losses (yellow rust caused shriveling in 60 per cent. grains and 50 per cent. reduction in grain weight while in black rust shrivelling varied from 7-50 per cent. and reduction in grain wieght from 29.2-68.8 per cent.). Out of 184 F.A.O. wheat varieties 17 were resistant to all the three rusts, 64 to black rust only, 61 to brown rust only, and 41 to yellow rust only. Amongst the local types C228 and C250 proved highly resistant to yellow rust, fairly resistant to brown rust and susceptible to black rust. Aerial spraying trials against rusts of wheat were carried out with copper compounds (Perònox and 4 per cent. Cuprosana). In the sprayed crop black rust infection was reduced by 66 per cent. on stems and 80 per cent. on ears. Similar aerial spraying trials are contemplated for the 1954-55 crop.

A survey of Punjab wheat has shown that the crop is heavily infested with weeds, resulting in a great reduction in yield. In January 1955 aerial spraying trials will be carried out with 2,4-D to find out its efficacy and economy.

A Central Mycological Herbarium was established in 1950 and to date 3125 specimens have been identified, authentically named and added to the Herbarium. Out of these 12 are new records for the Indo-Pakistan sub-continent and one i.e. Meliola sp. on Butea frondosa has not so far been recorded anywhere, as reported by the Commonwealth Mycological Institute, Kew.

This Division has recently introduced a system of fortnightly radio talks on diseases and is publishing "A Guide to Plant Diseases and their Control" and three disease charts for the benefit of the farmers.

NOTES FROM INDIA

Cereal rusts — Incidence of wheat rusts this year is generally low, partly due to the paucity of winter rains.

A case of colour mutation has been observed in race 194 of Puccinia graminis tritici. The mutant shows significant differences in colour and size of spores as also in the incubation period.

Maize mosaic — The disease was observed at New Delhi, in an out-of-season experimental crop. The virus nature of the disease has been established and found to be different from sugar-cane mosaic virus: as it is unable to infect sugar-cane. The virus has been successfully transmitted by three different species of aphids, namely, Aphis maidis, A. gossypi,and Microsiphon granarium. Phalaris minor, a winter wild grass, has been found to be a symptomless carrier of the virus.

Sugar-cane mosaic — The insect vector of sugar-cane mosaic virus in India yet remains undetermined. Recent experiments on insect transmission have, however, shown that Aphis maidis can successfully transmit the disease to sugar-cane varieties Co. 313 and Surkha saharanpuri after it has fed on mosaic-affected plants of Jowar (Sorghum vulgare) or the soft-leaf, noble cane variety Surkha Saharanpuri, but not directly from mosaic-affected plants of Co. 313.

Yellow vein mosaic of Bhindi — Bhindi or Lady's Finger (Abelmoschus esculentus) is very severely affected by this mosaic disease in northern India, which sometimes results in total failure of the crop. Two alternative hosts of the virus have been found in common weeds, namely, Croton sparsiflorus and Ageratum conyzoides. All the cultivated varieties of Abelmoschus were found susceptible except A. manihot var. pungens, which has been found to be immune and may prove to be a useful source of resistance for evolving resistant varieties.

Mango malformation — A serious disease of this most important fruit crop in India. The plants are affected both in the nursery as well as in the adult stage. The disease is characterised by bunchy leaf formation at the growing point of branches, comparable to rosetting in the nursery stage and malformation of the inflorescence in the adult stage. The cause of the disease has not yet been fully determined.

Exsiccati sets of Indian Fungi — Herb. Crypt. Ind. Orient., Indian Agricultural Research Institute, New Delhi, is trying to issue exsiccati sets of Indian Fungi for exchange with other Herbaria of the world. Two Fascicles of Indian Uredinales and the first Fascicle of Indian Ustilaginales have already been issued.

R.S. Vasudeva

NOTES FROM CANADA

International Botanical Congress: The IXth International Botanical Congress will be held in Canada in 1959 and it is anticipated that most of the Sections will meet in Montreal. As a start on preparations, a temporary organizing committee met in Ottawa in December. This committee invited various interested societies, universities and other institutions across Canada to appoint representatives, who will comprise the Council of the Congress. This Council has yet to choose the Executive Committee. As a rough estimate it is anticipated that 2,500-3,000 persons will attend the Congress.

Post-doctorate Fellowships: Since 1948 the National Research Council of Canada has offered a number of post-doctorate fellowhips to qualified men and women from Canada and other countries to carry on fundamental research in the Council's laboratories in association with senior members of the staff. In the early years nearly all the awards were for research in pure chemistry and physics but more recently awards have been made in some branches of the biological sciences.

This year the programme was further broadened by participation of the Canada Department of Agriculture. About fifteen fellowships will be tenable in Science Service Laboratories of the Department, in which there is adequate space and equipment for a visiting fellow to carry out research. In the Botany and Plant Pathology Division two fellowships are being offered: one in Systematics and Experimental Mycology at Ottawa and another in Diseases of Forage Crops or Cereals at Lethbridge.

These awards are tenable for one year and applications for renewal for a second year will be considered. They carry an adequate stipend and a generous travel grant with extra provision for men that are married. The Department of Agriculture has issued a brochure, "Post-doctorate Fellowships, Department of Agriculture 1955-56 in co-operation with the National Research Council of Canada", which is available to interested persons. The applications for 1955-56 closed on February 15th, 1955.

Correction

In reporting on some of the potato virus work centred at Fredericton, N.B. in the first number of the C.P. News the impression may have been given that the seriological test had been abandoned in favour of the plant indicator method. Such is not the case; they are complementary. By the seriological method it is possible for hundreds of tests to be made daily in the field and to remove the infected plants as they are found. Those that escape detection can then be determined by the more sensitive but much slower indicator method. When the two methods are used to complement each other as indicated above, they are the most efficient known for obtaining a nucleus of virus X-free potatoes from stocks that have a high percentage of infection.

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OTHER NEWS ITEMS

Mushroom Research Station Closed

It was agreed between the Mushroom Research Association, the Glasshouse Crops Research Institute, and the Ministry of Agriculture that the station at Yaxley should close before the end of 1954 and research activities be transferred to the new Glasshouse Crops Research Institute at Toddington, Sussex, under the administration of the A. R. C.

P. B. Flegg and Misses Gandy and Warman have moved to Toddington and Dr. R. L. Edwards, Director, has taken up mushroom growing and practice as a consultant.

Communications regarding research should be addressed to the Director of the Toddington Institute; general advice will be undertaken by the N. A. A. S.

Dr. R. L. Edwards, Ratcliffe Lodge, South Luffenham, Oakham, Rutland, is handling enquiries regarding international mushroom conferences and personal matters.

The M. G. A. has transferred its offices to the headquarters ot the National Farmers' Union and the address of the Secretary is 45, Bedford Square, London, W. C. 1. (Tel. MUSeum 7525-9)

Research Medal in Agriculture

The Royal Agricultural Society of England is offering a Research Medal and 100 guineas each year for what is considered to be the best piece of research likely to prove of benefit to agriculture. Names of entrants for this award will only be accepted from heads of research departments, institutes and the like.

The seventh international symposium on plant protection will be held in Ghent on April 26th and will coincide with the quinquennial Floralias of Ghent. Enquiries to Professor J. van den Brande, State Agricultural College, Conpure Links 233, Ghent, Belgium.

The fifth session of the Council of the European Plant Protection Organisation is being held in Paris on 27th to 29th April, 1955.

IMPORTANT NOTICE

All who kindly contribute to C. P. News please note that the last date for receipt of copy at the C. M. I. has had to be advanced to the first of the month prior to publication, i. e. 1st March, June, September, and December.

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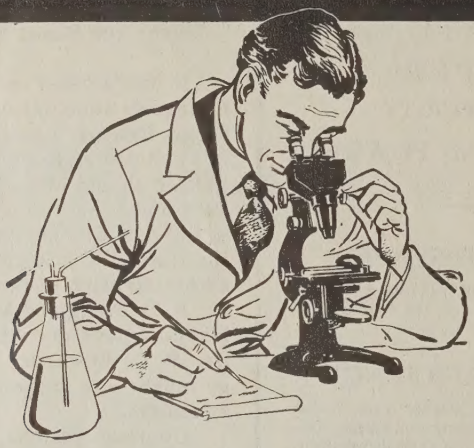

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